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Should there be an upper age limit for breast cancer screening?

Breast cancer screening

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Abstract

Aim: Breast cancer screening age is between 40-69 years in women of our country. The purpose of this study is to examine the effect of breast cancer screening on tumor diameter and surgical technique for women at or above the screening age interval. Material and Method: The data of 133 female patients aged 40 and above who underwent surgery due to the breast cancer between years 2010 and 2018 in Ordu, Turkey, were collected retrospectively. Patients were divided into two groups as Group 1 (n = 102, between ages 40-69) and Group 2 (n = 31, aged 70 and above). Results: In Group 1, the average tumor diameter of 48 patients (47.1%) diagnosed with physical examination (PE) was 2.96 ± 1.2 cm and average tumor diameter of 54 patients (52.9%) diagnosed with mammography (MG) was 1.48 ± 0.58 cm (p < 0,001). In Group 1, 36 (66.7%) of 54 patients diagnosed with MG underwent breast conserving surgery (BCS), and 18 (33.3%) underwent modified radical mastectomy (MRM). Meanwhile, 25 (52.1%) of 48 patients diagnosed with PE underwent BCS and 23 (47.9%) underwent MRM (p = 0.13). In Group 2, the average tumor diameter of 24 (77.4%) patients diagnosed with PE was 3.18 ± 1.48 cm and the average tumor diameter of 7 (22.6%) patients diagnosed with MG was 2.74 ± 0.79 cm (p = 0,55). In Group 2, 3 (42.9%) of 7 patients diagnosed with MG underwent BCS, and 4 (57.1%) underwent MRM. Meanwhile, 9 (37.5%) of 24 patients diagnosed with PE underwent BCS, and 15 (62.5%) underwent MRM (p = 0.79). Discussion: Tumor diameter was determined to be smaller in breast cancer screening group among women at or above the age interval of the breast cancer screening program. Although, the effect of screening on surgery type was not statistically significant, it has increased breast-conserving surgery. The breast cancer screening program should not be planned according to the chronological age, and instead, life expectancy should be regarded.

Keywords

Breast Cancer; Screening Program; Surgical Technique

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Introduction

Breast cancer is the most common cancer type in women and it constitutes 23% of ~ 1.7 million cancers newly diagnosed in women every year [1,2]. The purpose of breast cancer screening is to detect tumor at a small size while it has not presented clinical symptoms yet, and thus provide a decrease in deaths associated with breast cancer. Five-year relative survival rates for breast cancers are as follows: 99 percent for localized cancers, 85 percent for regional cancers and 26 percent for metastatic cancers [3]. Breast cancer screening programs are performed until age 70 in many countries. Nevertheless, with the advancement of contemporary life standards, preventive medicine and the increases in treatment opportunities, lifespan has significantly increased. The incidence of breast cancer increases with age. More than 30% of breast cancer patients are older than 70 [4]. The purpose of our study was to compare tumor diameter between patients between ages 40-69 who were included in a breast cancer screening program, and patients aged above 70 years old, and to examine the relation between surgical techniques and mammography (MG) screening.

Material and Method

Patients aged 40 and above, who underwent surgery due to the breast cancer between years 2010 and 2018 in public hospitals connected to local health authority of Ordu, and whose data were available in the retrospective review, were included in the study. Patients were separated into two groups according to their age; Group 1 consisted of women aged between 40-69 years that is breast cancer screening age interval (and Group 2 consisted of women aged 70 and above. In our study, whether patients had undergone breast cancer screening, and data on tumor diameter and surgery techniques were reviewed retrospectively for screened and not screened patients. Ethical approval of the work has been approved by the Institutional Review Board of Ordu University.

Statistics

Descriptive statistics for continuous variables are presented as average, standard deviation, minimum and maximum values; and they are presented in numbers and percentage for categorical variables. Kolmogorov-Smirnov normality test has been performed in order to compare tumor diameters in numeric variables, and the Mann-Whitney U test was performed to compare the tumor diameter of groups. Chi-square test and Fisher's test have been performed to determine the relationship between categorical variables (groups). In calculations, statistically significant level was assumed as 5% (p = 0,05), and SPSS (IBM SPSS for Windows, Ver.24) statistical package program has been used for calculations.

Results

All 133 patients who were included in the study were female, and the average age was 60.47 ± 12.77 (41-94) years. Group 1 included 76.7% (n=102) of patients, and 23.3% (n=31) of patients were assigned to Group 2.

Seventy-two (54.1%) patients were diagnosed based on their physical examination (PE) and 61 (45.9%) patients were diagnosed with MG. Forty-seven point one percent of Group 1 patients (n=48) were diagnosed with PE and 52.9% (n=54) were diagnosed with MG. Seventy-seven point four percent (n=24) of Group 2 patients were diagnosed with PE and 22.6% (n=7) were diagnosed with MG. There was a statistically significant difference between the two groups with regards to diagnosis method (p = 0003).

Average tumor diameters of patients operated for breast cancer were 2.35 ± 1.28 (min. 0.2 - max. 9) cm. Average tumor diameter was 2.17 ± 1.19 cm (min. 0.2- max. 6.5) in Group 1, and it was 2.92 ± 1.41 (min. 1.3 – max. 9) cm in Group 2. There was a statistically significant difference between groups with regards to tumor diameter (p = 0.001).

While the average tumor diameter of 48 patients diagnosed with PE in Group 1 was 2.96 ± 1.2 cm, average tumor diameter of 54 patients diagnosed with MG was 1.48 ± 0.58 cm. There was a statistically significant difference between diagnosis method and tumor diameter (p < 0,001).

While the average tumor diameter of 24 patients diagnosed with PE in Group 2 was 3.18 ± 1.48 cm, average tumor diameter of 7 patients diagnosed with MG was 2.74 ± 0.79 cm. Although not statistically significant, a quantitative difference was observed between the diagnosis method and tumor diameter (p=0,55).

Upon evaluating tumor diameter according to diagnosis method for all patients included in the study, average tumor diameter of 72 patients diagnosed with PE was 3.04 ± 1.3 (min. 1 – max. 9) cm, and average tumor diameter of 61 patients diagnosed with MG was 1.62 ± 0.73 (min. 0.2 – max. 3.7) cm. There was a statistically significant difference between diagnosis method and tumor diameter (p < 0,001).

With regards to the surgery type and diagnosis method in Group 1 patients, 66.7% of 54 patients diagnosed with MG underwent breast-conserving surgery (BCS) (n=36), and 33.3% underwent modified radical mastectomy (MRM) (n=18). Meanwhile, 52.1% of 48 patients diagnosed with PE underwent BCS (n=25), and 47.9% underwent MRM (n=23). Although diagnosis method affected the surgery type, there was no statistically significant difference (p=0.13).

Upon examining the surgery type and diagnosis method in Group 2 patients, 42.9% of 7 patients diagnosed with MG underwent BCS (n=3), and 57.1% underwent MRM (n=4). Meanwhile, 37.5% of 24 patients diagnosed with PE underwent BCS (n=9), and 62.5% underwent MRM (n=15). There was no statistically significant difference between those (p=0.79).

When all patients included in the study were examined for a difference between diagnosis method and surgery type, it was determined that 63.9% (n=39) of 61 patients diagnosed with MG underwent BCS and 36.1% (n=22) underwent MRM. Meanwhile, 47.2% of 72 patients diagnosed with PE underwent BCS (n=34), and 52.8% underwent MRM (n=38). There was no statistically significant difference between diagnosis method and surgery types (p=0.054). The data of the study are summarized in Table 1.

Discussion

Delays in diagnosis and treatment of breast cancer increase the morbidity and mortality in patients. Screening programs have great importance since breast cancer in the most com-

Table 1. Analyze of tumor diameter and surgical techniques between groups.

	Group 1			Group 2			Total		
	Screening (54/102)	PE (48/102)	P value	Screening (7/31)	PE(24/31)	P Value	Screening (61/133)	PE (72/133)	P value
Average diameter of tumor according to diagnosis pattern	1,48+-0,58	2,96+-1,20	<0,001	2,74+-0,79	3,18+-1,48	0,55	1,62+-0,73	3,04+-1,30	<0,001
Average diameter of tumor	2,17+-1,19			2,92+-1,41			2,35+-1,28		
BCS	36/54	25/48	0,13	3/7	9/24	0,79	39/61	34/72	0.054
Number of patients with BCS	61			12			73		
MRM	18/54	23/48	0,13	4/7	15/24	0,79	22/61	38/72	0.054
Number of patients with MRM	41			19			60		

Abbreviations. Physical examination: PE, Breast conserving surgery: BCS, Modified radical mastectomy;MRM

mon form of cancer observed in women and there is an increase in its prevalence. The most common method of early detection is MG, low dose X-ray imaging of the breasts used to identify abnormalities. Screening of breast cancer with MG was first performed starting from the 1960s in New York with the Health Insurance Plan [5]. Particularly after the 1980s, upon understanding the benefit of MG, MG screening became prevalent all around the world starting with the Western countries. The use of this method has shown a 25%-30% decrease in death due to the breast cancer as a result of 25-year follow-up [6]. The relationship between the combination of early stage and effective treatment and the good prognosis is obvious. According to the American Cancer Society's 2014 data, 61% of breast cancer diagnoses can be determined at an early stage. Five-year survival expectancy of patients who were diagnosed at the early stage is 99%.

In 2014, the standards to follow in population-based breast cancer screening program studies have been re-established by Turkey Ministry of Health Public Health Institute and they were issued under the title 'National Standards of Breast Cancer Screening Program'. Accordingly, in Turkey, it was adopted to perform screening MG once every two years in all women aged between 40-69 years old. In the breast cancer screening guidelines prepared by Turkish Society of Radiology, starting age for mammographic screening was adopted as 40 and yearly checks were recommended.

Nowadays, the number of patients aged over 70 years is increasing. The health status of a significant part of women aged 70 is good and their life expectancy may be longer than 10 years. According to 2016 data of Turkish Statistical Institute, overall lifespan in Turkey is 78 years; 75.3 years for men and 80.7 years for women. While life expectancy is 15.3 years for women aged 70, it is 8.7 years for women aged 80. According to 2010 data from the USA, approximately 50% of women aged 80 and 25% of women aged 85 will live for at least another 10 years [7,8]. The most important risk factor of breast cancer is advancing age [9]. According to 2013 data of American Cancer Society (ACS), breast cancer is predominantly a disease of older women with 43 % of incident cases, and 57.0 % of deaths due to breast cancer occurring in women aged 65 years and older. Breast cancer develops in the following 10 years in 3.8% of patients aged 70 and above [10]. In our study, a significant rate of (23.3%) breast cancer cases consisted of women aged 70 and above. So, can't these women be included in the screening program for an earlier diagnosis?

When women aged 70 and above were included in the screening MG which were applied once every 2 years for 10 years, it was found that mortality due to the breast cancer decreased by 0.2% compared to patients who have attended those until age of 69 [8]. MG was confirmed to have high value for cancer detection rate and positive biopsy estimation rate in women aged 70 and above, and screening efficiency have been approved for elderly patients [11]. The American Cancer Society recommends that women continue participation in MG screening, regardless of age, as long as they have no serious chronic conditions or shortened life expectancy. MG screening should be performed in patients with life expectancy longer than 5 years without setting an upper age limit [12]. In our study, tumors were detected at an earlier stage (with smaller diameter) in women aged 70 and above who underwent breast cancer screening, as in young women.

The basic approach in the surgical treatment of breast cancer is choosing the method that is least likely to affect the quality of life of patients, after obtaining acceptable oncological results. Mastectomy is a more traumatic procedure than BCS for every woman with breast cancer. According to the clinical trials, there is no difference between total and disease-free survival between BCS and MRM [13]. Quality of life-determining problems such as anxiety, depression, psychosexual problems, being bothered by physical appearance and limitation in physical functions, which are experienced due to cancer, are observed less in patients who underwent BCS compared to patients who underwent MRM [14]. The tumor size of breast cancers detected with screening is smaller and they are more likely to be treated with BCS instead of MRM [11]. Independent from the age of breast cancer patients, tumor size of cases diagnosed with MG is smaller in our cases. Although many factors such as the life expectancy of the patient, experience of the surgeon, technical possibilities, the willingness of the patient, size of the breast and location of the tumor affect the surgery type, BCS rate is higher in quantity in screened patients, albeit not statistically different in our study.

Conclusion

Breast cancer is the most common malignancy observed in women and its prevalence increases with age. Since life-span of populations gets longer, the elderly population is ever-increasing. In parallel, the number of elderly women with breast cancer is also increasing. Independent from their age, tumors in women included in the screening program is determined at

a smaller diameter. Consequently, life-span of people is getting longer, it would be more appropriate to plan a screening program according to the life expectancy instead of chronological age.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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